CARLSBAD ENERGY CENTER PROJECT

Carlsbad Energy Center LLC

FIRE RISK AND EMERGENCY RESPONSE ASSESSMENT REPORT

November 7, 2008

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ASSISTED BY:

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1.0 Introduction

At the request of Carlsbad Energy Center LLC, Patch Services conducted an independent review and assessment of the adequacy and completeness of the Carlsbad Energy Center Project's (CECP's) fire risk management system and hazardous materials management system and the City of Carlsbad Fire Department's (CFD's) associated ability to provide fire protection and emergency response services to the proposed CECP. CECP, when permitted and constructed, will be a 540.4 megawatt (MW) net and 558 MW gross natural gas-fired combined-cycle power plant located on the portion of the existing Encina Power Station (EPS) east of the railroad tracks in Carlsbad, California. This report will be docketed with the California Energy Commission (CEC) as supporting information for the CEC's licensing process for CECP (Application for Certification 07-AFC-6).

As documented in a May 28, 2008 Record of Conversation (ROC) between CEC Staff and CFD Fire Marshall (see Attachment A), related to CFD's anticipated ability to provide fire and emergency response services to CECP, the CFD Fire Marshall indicated currently CFD is able to appropriately respond to incidents throughout the City in 6 minutes from their series of fire stations. In particular, the closest fire station to EPS and the second closest fire station to EPS are each capable of responding to an incident at EPS in 6 minutes and 7 to 8 minutes, respectively – both considered above average response times by municipalities. However, the Fire Marshall indicated he is not sure how well CFD will do in the future as, according to the Fire Marshall, CFD has not expanded while the City of Carlsbad has grown. The Fire Marshall is particularly concerned that a large seismic event in the region would require all of CFD's resources.

Based on the information included in the following sections of this report, there are a number of key factors that will ensure that the combined CECP and EPS (i.e., when the proposed 540.4 MW plant and existing Units 4 and 5 are operational) fire risk and emergency response requirements are significantly reduced as compared to existing operation of EPS. In addition, as discussed in the AFC and based on the factors below, CECP will result in a less than significant impact on fire and emergency response services, and will not contribute to an incremental impact on the overall capability of CFD to continue to provide appropriate fire protection and emergency response services throughout the City. In summary, these factors include:

- CECP will include state-of-the-art fire detection and protection systems that meet all applicable national and state fire code requirements, and will meet all applicable fire protection and hazardous materials handling law, ordinances, regulations and standards (LORS).
- CECP will allow for the retirement of three (Units 1, 2 and 3) of the five older technology steam boiler electrical generation units at the existing EPS. While the existing generation units at EPS have robust fire detection and protection systems that meet all fire code requirements, the retirement of Units 1, 2 and 3 does result in an overall reduction of fire risk at EPS since 60 percent of the existing units which are more than 50 years old will be retired.
- CECP is to be located within the existing EPS's eastern tank farm and, as such, three surplus fuel oil tanks (Tanks 5, 6 and 7) will be demolished to as part of CECP. While these three fuel oil tanks have been maintained in a safe condition, are substantially empty, and are supported by high pressure fire water lines (one per tank), the demolition

of these tanks as part of CECP removes a potential fire and emergency response requirement.

- CECP combined-cycle units will be configured and permitted to use only clean-burning natural gas, and shall not be permitted to burn fuel oil.
- EPS has been required by the California Independent System Operator (CAISO) under the reliability must run (RMR) program to be supported by two fuel oil tanks (Tanks 2 and 4) that provide backup fuel oil for power plant operations in the event of a curtailment of natural gas supply to EPS. While not related to CECP, in October 2008 CAISO determined that as of January 2009 EPS will no longer be required to store fuel oil as a backup to natural gas for the operation of the existing EPS units. As a result, a combined fuel oil storage capacity of 30 million gallons at EPS will be eliminated. This represents a significant reduction in the overall potential fire and emergency response requirement at EPS. (Note: While as of January 2009 fuel oil backup will no longer be required, Tanks 2 and 4 at EPS will remain in place until a program is developed to remove the surplus oil and remove the tanks. The removal of Tanks 2 and 4 will be accomplished as part of the operations of EPS and is not part of CECP.)
- CECP's state-of-the-art, combined-cycle units and its supporting systems generally use fewer hazardous materials and reduced volumes of hazardous materials as compared to the existing EPS. The use of hazardous materials by CECP will be managed in strict accordance with all applicable LORS. As documented in the Hazardous Materials Handling section of the AFC (Section 5.5), CECP will result in a less than significant impact from hazardous materials handling. In addition, with the retirement of Units 1, 2 and 3 at EPS, the volume of hazardous materials used to support operations of EPS will generally be reduced as compared to the volumes currently used. This combine reduction in the volume of hazardous materials at EPS represents a reduction in the overall fire and emergency response requirements at EPS.
- CECP includes a new emergency access route that will allow emergency response equipment to enter the CECP site from Cannon Road via Avenida Encinas, thereby eliminating the need for emergency response equipment to cross the railroad tracks located west of I-5. This new emergency access route will be across SDG&E property using a prescriptive easement that is in place. This new emergency access route is in addition to the existing access routes that support existing operations at EPS. This new emergency access route will also provide an additional emergency access route to the existing EPS. Therefore, as part of CECP, the improved emergency access to EPS is a beneficial effect of the project.
- As reported in the AFC and as confirmed by the CFD Fire Marshall (see Record of Conversation – Attachment A), the response time from the CFD fire station nearest to EPS is 6 minutes. The response time from the second closet CFD fire station is 7 to 8 minutes. The response time of 6 minutes is considered excellent as most municipalities have established a response time goal of 8 minutes or less 90 percent of the time from the full first alarm assignment of response resources.

In conclusion, the CECP demonstrates compliance with all applicable fire protection and hazardous materials handling LORS, and includes a state of the art fire protection system that supports a reduced fire risk potential. The collocation of CECP, coupled with the retirement of EPS Units 1, 2 and 3, acts to reduce the on-site hazardous materials inventory that supports the current operations of

the EPS. While the existing EPS Units 1 - 5 have and continue to maintain a substantial fire protection system and emergency response program, the addition of CECP at this site creates an aggregate reduction in combined fire risk and hazardous material inventory and significantly reduces the probability of the need for emergency response.

Regarding the concern of the CFD Fire Marshall that a large seismic event in the region would require all of CFD's resources, this report does not include an assessment of CFD's response capabilities in the event of a large seismic event. However, as discussed in this report, CECP will result in a less that significant impact or fire and emergency responses services and will result in an aggregate reduction in combined fire risk and emergency response requirements. As a result, CECP will not contribute to an incremental impact of the overall capability of CFD to provide fire and emergency response services during a large seismic event in the region.

2.0 Fire Risk and Emergency Response Assessment

2.1 Background

Carlsbad Energy Center LLC (Applicant) submitted an Application for Certification (AFC) to the CEC for the CECP on September 14, 2007. On July 25, 2008, the Applicant submitted the Project Enhancements and Refinements document to the CEC to provide refined project details. These two documents and other pertinent documents regarding CECP and the EPS have been reviewed for information regarding fire risk and emergency response procedures.

The CECP will use portions of the existing EPS site; specifically CECP will be located within EPS's existing eastern tank farm. The existing EPS consists of Units 1 – 5 located in one large building. Implementation of the CECP will result in the reduction of existing operations at the EPS by the decommissioning of existing EPS Units 1, 2, and 3 (EPS Units 4 and 5 will remain in operations), and the removal of three existing fuel tanks (Tanks 5, 6 and 7). In place of the removed fuel oil tanks, the CECP will be constructed using the latest process and control technology systems for fire detection and protection and for the storage and use of hazardous materials use to support operations of CECP. CECP will comply with all applicable national, state and local LORS for fire protection, hazardous materials storage and handling procedures, and emergency response planning requirements.

The CECP will be a new natural gas-fired combined-cycle generating facility located on the existing EPS. The CECP consists of two new power stations, Units No. 6 and No.7, each comprised of one 195.2 MW combustion turbine generator (CTG) and one 61.4 MW steam turbine generator (STG) per Unit with a net output of 256.6 MW for each Unit. The CTGs will be Siemens Rapid Response SCC6-5000F Combine Cycle (R2C2) machines designed and equipped with state-of-the-art fire detection and fire protection systems. The fuel supply to the CECP will be provided by the Southern California Gas Company (SoCalGas) via an existing 18-inch, high pressure gas pipeline through a new connection that will support CECP.

As discussed in Section 5.5 of the AFC, CECP operations will involve the use of aqueous ammonia (19 percent solution) as part of its air emissions control system as well as other miscellaneous hazardous materials necessary to support the operation of CECP. Aqueous ammonia will be stored in two stationary aboveground storage tanks. The capacity of the tanks will be approximately 10,000 gallons each: however each tank will only be filled to a maximum of 85 percent of the tank capacity or 8,500 gallons, for a total maximum storage of 17,000 gallons. Aqueous ammonia will be

delivered to the site by truck, with an average of one to two deliveries per month, with a maximum of five deliveries per month during peak operations.

Table 1 (see Attachment B) presents a list of the existing EPS and CECP quantities of hazardous. Table 1 groups the hazardous materials into the following four categories: aqueous-based, fuel oils, petroleum-based, and gases. Table 1 also presents the reduction in the volume of hazardous materials that will be used at the existing EPS after the retirement of Units 1, 2 and 3, and presents the revised combined volume of hazardous materials for the operation of CECP and continued operations of Units 4 and 5. In summary, Table 1 shows that the combined qualities of hazardous materials for operation of CECP and the continued operations of Units 4 and 5 at the EPS are as follows:

- Aqueous-Based

  With exception of aqueous ammonia, volumes are reduced or are only minor increases

- Fuel Oil

  Elimination of 30 million gallons of storage capacity for Fuel Oil No. 6.

- Petroleum-Based

  Minor increases

- Gases

  Significant reduction in volumes

2.2 Fire Risk Evaluation

Section 2.2.12 – Fire Protection of the CECP AFC was also reviewed as part of this analysis. This section addresses the fire protection design criteria for CECP that are consistent with current applicable National Fire Protection Association (NFPA) Codes 12, 20, 850 and 2001 Standards. As described in the AFC, there are two separate fire protection systems that will support CECP - the existing EPS hydrant system in the tank farm area, which will remain, and the new Siemens R2C2-supplied fire detection and protection system. Figures 2.2.7 and 2.2.8 from the CECP AFC illustrate these two systems respectively (see Attachments C and D).

The CECP fire protection system will consist of wet pipe sprinkler systems, closed head (pressurized) dry pipe deluge systems, water mist local applications, and CO_2 or FM200 fire suppression agent for total flooding applications. The fire detection elements of the fire protection systems include fuel gas leak detectors, thermal rate compensated smoke detectors, and manual pull stations. These modern devices are digital which have quick response capabilities for responding to any fire potential. Their Fire Alarm Control Panels (FACPs) are capable of identifying the exact location of activated detector(s), and will activate automatically following release of extinguishing agents to put out fires and simultaneously shut down affected equipment. Thus, the CECP fire protection systems will be modernized and improved as compared to the existing EPS systems: though as noted above, the existing EPS meets all engineering standards and regulatory standards and regulatory requirements for fire protection and emergency response

Other fire hazards are presented by existing trees and vegetation along the railroad corridor that border the CECP site as well as by other man-made and natural structures such as the overhead 230-kVand 138-kV interconnecting transmission lines. These transmission structure hazards have been addressed in the CECP AFC acknowledging compliance with required clearances (CPUC GO-95).

The natural gas fuel supply to the CECP could also pose a fire and explosion hazard in the event of a pipeline leak from the main SoCalGas distribution pipeline. The CECP fire protection system described in the AFC addresses this potential hazard by assuring full compliance with applicable codes, regulations, and industry design/construction standards in the design and construction of the CECP gas pipeline interconnection. In fact, the CECP AFC further includes proposed Conditions of Certifications (COCs) requiring the CECP-owned natural gas pipeline undergo a complete design review and detailed inspection every 30 years after initial installation and each five years thereafter to ensure proper integrity and to ensure compliance with applicable LORS.

CECP AFC Section 5.5.6.5.2 Security Plan includes a fire alarm monitoring system as part of its plan with around the clock security staff, which further enhances plant safety.

CECP is to be located within the existing EPS's eastern tank farm and, as such, three surplus fuel oil tanks (Tanks 5, 6 and 7) will be demolished to as part of CECP. CECP combined-cycle units will be configured and permitted to use only clean-burning natural gas, and shall not be permitted to burn fuel oil. While these three fuel oil tanks have been maintained in a safe condition, the demolition of these tanks as part of CECP removes a potential fire and emergency response requirement.

In addition to the three surplus fuel oil tanks that will be removed as part of CECP, the existing EPS, has been required by the California Independent System Operator (CAISO) under the reliability must run (RMR) program to be supported by two additional fuel oil tanks (Tanks 2 and 4) that provide backup fuel oil for power plant operations in the event of a curtailment of natural gas supply to EPS. While not related to CECP, in October 2008, CAISO determined that as of January 2009, EPS will no longer be required to store fuel oil as a backup to natural gas for the operation of the existing EPS units. As a result, a combined fuel oil storage capacity of 30 million gallons at EPS will be eliminated. This represents a significant reduction in the overall potential fire and emergency response requirement at EPS. (Note: While as of January 2009 fuel oil backup will no longer be required, Tanks 2 and 4 at EPS will remain in place until a program is developed to remove the surplus oil and remove the tanks. The removal of Tanks 2 and 4 will be accomplished as part of operations of EPS and is not part of CECP.)

2.3 Hazardous Materials Evaluation

Hazardous materials such as gasoline, motor oil, hydraulic fluids, solvents, cleaners, sealants, welding flux, lubricants, paint and paint thinner etc. will be used during construction. These materials are used in small amounts as compared the volume of aqueous ammonia used by EPS and CECP as part of air emission control systems. Aqueous ammonia is a regulated substance used in the selective catalytic reduction (SCR) process during normal combustion turbine operations to control NO_x emission. CECP AFC Sections 1.7.12 Hazardous Material Handling, 2.2.10 Management of Hazardous Materials and 5.5.6.3 Aqueous Ammonia address onsite hazardous material storage and handling were also reviewed for this analysis. The storage of these materials meets and exceeds applicable LORS. These CECP AFC specifically call for appropriate chemical storage for the ammonia as an aqueous solution of 19 percent ammonia.. The CECP will have two aboveground storage tanks (ASTs), each with 10,000 gallon capacity, but each of these tanks will be filled to a maximum of 85 percent of the tank capacity for a maximum of 8,500 gallons per tank, for a total of 17,000 gallon of storage for CECP. Consistent with applicable LORS, these tanks are designed to be located within a secondary leak containment area, and each tank is provided with standard continuous tank level indication, automated leak detection system, temperature and pressure monitor and local alarms, and excess flow and emergency block valves.

A Risk Management Plan (RMP), as required by CalARP and Federal CAA, has been prepared for the EPS aqueous ammonia tanks and will be prepared for the CECP aqueous ammonia tanks. The RMP will conduct a hazard assessment including accidental release prevention and emergency procedures, a description of regulated process and substances handled, a worst-case ammonia release scenario and an alternative release scenario, a general accidental release prevention program, a five-year accident history, and planned changes to improve safety.

The EPS RMP, dated June 9, 2004, Revision 2, was submitted by Cabrillo Power LLC to San Diego County Department of Environmental Health. This RMP was found to be comprehensive and thorough. It describes full compliance with LORS with various safety features of the ammonia storage area including emergency shut down stations, alarms, leak detection, safety valves, and emergency eyewashes with water alarm flow switches. Similar devices and systems and their functions have been described in the CECP AFC. However, it should be noted, that the CECP digital technology and modern electronic devices are better and faster than their analog predecessors and thus will be superiority in providing early detection and fast response for any adverse conditions.

As shown in Table 1, CECP's state-of-the-art, combined-cycle units and its supporting systems generally use fewer hazardous materials and reduced volumes of hazardous materials as compared to the existing EPS. The use of hazardous materials by CECP will be managed in strict accordance with all applicable LORS. As documented in the Hazardous Materials Handling section of the AFC (Section 5.5), CECP will result in a less than significant impact from hazardous materials handling. In addition, with the retirement of Units 1, 2 and 3 at EPS, the volume of hazardous materials used to support operations of EPS will generally be reduced as compared to the volumes currently used. This combine reduction in the volume of hazardous materials at EPS represents a reduction in the overall fire and emergency response requirements at EPS.

2.4 Emergency Response Plan

The EPS RMP, Emergency Response Plan (ERP) and the CECP AFC address emergency response capabilities. These plans and the CECP AFC were reviewed and it was determined that they are comprehensive and comply with current LORS. These plans and the CECP AFC also discuss emergency communications, alarms and equipment, arrangements with local emergency response and fire fighting authorities, emergency action and fire prevention plans, spill prevention control and countermeasure plan and on-site emergency coordinator's duties and responsibilities.

The CEC Staff's ROC with the City of Carlsbad Fire Marshall (Attachment A)) regarding the fire needs assessment and emergency response requirements for CECP was also reviewed by the report preparers. The ROC with the Fire Marshal confirms information included in the CECP AFC; namely that the CDF's response time would be approximately 6 minutes to the CECP. The response time from the second closet CFD fire station is 7 to 8 minutes. The response time of 6 minutes is considered excellent as most municipalities have established a response time goal of 8 minutes or less 90 percent of the time from the full first alarm assignment of response resources.

The ROC also indicates that the San Diego County Department of Environmental Health (Health Hazardous Materials Division) has the ability to respond to anhydrous ammonia spills – a form of ammonia that is much more volatile and hazardous material than the aqueous ammonia currently used by EPS and will be used by the CECP. Thus, the County's capabilities for response to aqueous ammonia releases are acceptable.

In addition, CECP includes a new emergency access route that will allow emergency response equipment to enter the CECP site from Cannon Road via Avenida Encinas, thereby eliminating the

need for emergency response equipment to cross the railroad tracks located west of I-5. This new emergency access route will be across SDG&E property using a prescriptive easement that is in place. This new emergency access route is in addition to the existing access routes that support existing operations at EPS. This new emergency access route will also provide an additional emergency access route to the existing EPS. Therefore, the improved emergency access to EPS that will be provided as part of the CECP is another benefit of the project.

2.5 Risk Reduction Elements

There are various systems that contribute to reducing fire risk and emergency response requirements at the CECP. These systems include: Security, Electrical Power and Plant Control.

CECP AFC includes a proposed Condition of Certification HAZ-12 for a comprehensive Operations Security Plan, which includes the use of closed-circuit television (CCTV) cameras for various critical facility locations such as the ammonia storage area. These modern digital intelligent cameras detect motions and provide alarms.

The CECP Electrical Power System including the transmission and related switchgears, as described in AFC Appendix 2D, Electrical Engineering Design Criteria, will be equipped with microprocessor-based protective relays which have digital communication capability to quickly trip breakers and notify the utility SCADA System and the Plant Distributed Control System (DCS). The DCS as described in Section 2.2.13.3 of the AFC controls, monitors, and includes alarm functions for the two power generating blocks. The DCS can quickly disable and shut down the turbines when a critical malfunction occurs. It will also be digitally linked to the intelligent FACPs for shut down interlocks.

Review of Table 1, which lists all chemicals that would be used by the CECP and chemicals currently in use by EPS, illustrates that the CECP will generally use fewer chemicals and hazardous materials in smaller quantities than the EPS, thus reducing potential hazards. In addition, with the retirement of Units 1, 2 and 3 at the existing EPS, the volume of hazardous materials used for the remaining Units 4 and 5 at the EPS will also be less than currently used. The combination of CECP and the retirement of Units 1, 2 and 3 at the existing EPS results in an overall combined reduction in the volume of most hazardous materials on the EPS site (on which CECP is located). In addition, as discussed above, the fuel oil storage capacity of 30 million gallons at EPS will be eliminated, which represents a significant reduction in the overall potential fire and emergency response requirement at EPS.

3.0 Findings and Conclusions

Based on this analysis and evaluation, it is determined that the combined CECP and EPS fire risk and emergency response requirements are significantly reduced as compared to existing operation of EPS. In addition, CECP will result in a less than significant impact on fire and emergency response services, and will not contribute to an incremental impact on the overall capability of CFD to continue to provide appropriate fire protection and emergency response services throughout the City. As a result, the CECP results in an aggregate reduction in combined fire risk and emergency response requirements.

Regarding the concern of the CFD Fire Marshall that a large seismic event in the region would require all of CFD’s resources, this report does not include an assessment of CFD’s response

capabilities in the event of a large seismic event. However, as discussed in this report, CECP will result in a less that significant impact or fire and emergency responses services and will result in an aggregate reduction in combined fire risk and emergency response requirements. As a result, CECP will not contribute to an incremental impact of the overall capability of CFD to provide fire and emergency response services during a large seismic event in the region.

In conclusion, the CECP demonstrates compliance with all applicable fire protection and hazardous materials handling LORS, and includes a state of the art fire protection system that supports a reduced fire risk potential. The collocation of CECP coupled with the retirement of EPS Units 1, 2 and 3 acts to reduce the on-site hazardous materials inventory that supports the current operations of the EPS. While the existing EPS Units 1 - 5 have and continue to maintain a substantial fire protection system and emergency response program and capability, the addition of CECP at this site creates an aggregate reduction in combined fire risk and hazardous material inventory and significantly reduces the probability of the need for emergency response.

As part of this review, it has been concluded that the CECP will result in reduced fire risk and reduced emergency response requirements as compared to the existing EPS for which the fire risk and emergency response requirements meet all engineering standards and regulatory requirements for fire protection and emergency response. In fact, through this assessment, it has been determined that the CECP, which will include on-site modern fire and emergency response equipment including digital technology, will have superior performance in fire protection and early fire detection and a reduction of the emergency response requirements for its facilities.

Disclaimer

This report was prepared and strictly relied on referenced documents furnished by CH2M HILL. These documents include the CECP AFC, its Project Enhancements and Refinements Document, the EPS Risk Management Plan and Emergency Response Plan, and Final Phase I ESA.

This report is strictly a technical report with the professional opinion expressed independently by Patch Services. This report is not a legal document or an interpretation of any LORS. Due to the Report's scope limitations, no field investigations, or personal contacts with public agency emergency personnel were conducted to verify and to assess the existing fire risk and emergency response requirements of the existing facilities in details. The qualifications of the Report preparers are provided in next page.

Qualification of Report Preparers

Diep T. Nguyen, PE holds a BSEE and MSEE degrees in both power system engineering from SFSU and SCU, respectively. Mr. Nguyen is a licensed professional engineer (**PE**) in **electrical (E-10687), control systems (CS-7072), fire protection (FP-1317) engineering disciplines** in California and five other States. He has over 32 years of practical, hands-on experience in electrical power system, control system and fire protection design and construction of large wastewater and water facilities, power plants, airports and terminals, data processing centers, high-rise buildings, hospitals, and educational institutions. His specialties are low and medium voltage power distribution, low and medium voltage motor control centers, switchgear, emergency and standby

power systems, Variable Frequency Drives (VFDs), Solar Power PV Systems, Cogeneration Facilities, Fire Protection Systems, Distributed Control Systems (DCS), Programmable Logic Controllers (PLC) and SCADA Systems (fiberoptic, licensed and un-licensed radios) and software configuration. He is a senior member of IEEE, ISA, NFPA and is certified as a Certified Cogeneration Professional **(CCP)** and Distributed Generation Certified Professional **(DGCP)** as well as a **Legend in Energy** Certificate by the National Association of Energy Engineers (AEE). He also holds California General Contractor License and Electrical Contractor License.

A. Dan Johnson, PE holds a BSME. As a licensed professional engineer in California, he has over 20 years of practical, hands-on experience, including 12 years of experience in environmental remediation and 18 years of experience in power generation. He also has experience in construction oversight, plant operations and maintenance, and process design. Systems include cogeneration, single cycle gas turbine heat recovery steam generators, and solar thermal power plants. He also holds a US Patent.

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Attachments

A. CEC Staff Record of Conversation with City of Carlsbad Fire Marshal – May 28, 2008

B. Table 1 Hazardous Materials List – Comparison of CECP and EPS

C. Figure 2.2.7 – Existing EPS Fire Protection System

D. Figure 2.2.8 – CECP New Fire Protection System

ATTACHMENT A

CEC Staff Record of Conversation with City of Carlsbad Fire Marshal – May 28, 2008

Telephone Conversation Record

To:	Fire Marshal James Weigand Carlsbad Fire Department (CFD)
From:	Shon Greenberg Risk Science Associates
Phone Number:	(760) 602-4661
Date:	May 28, 2008, 8:30am
Regarding:	Carlsbad Energy Center Project

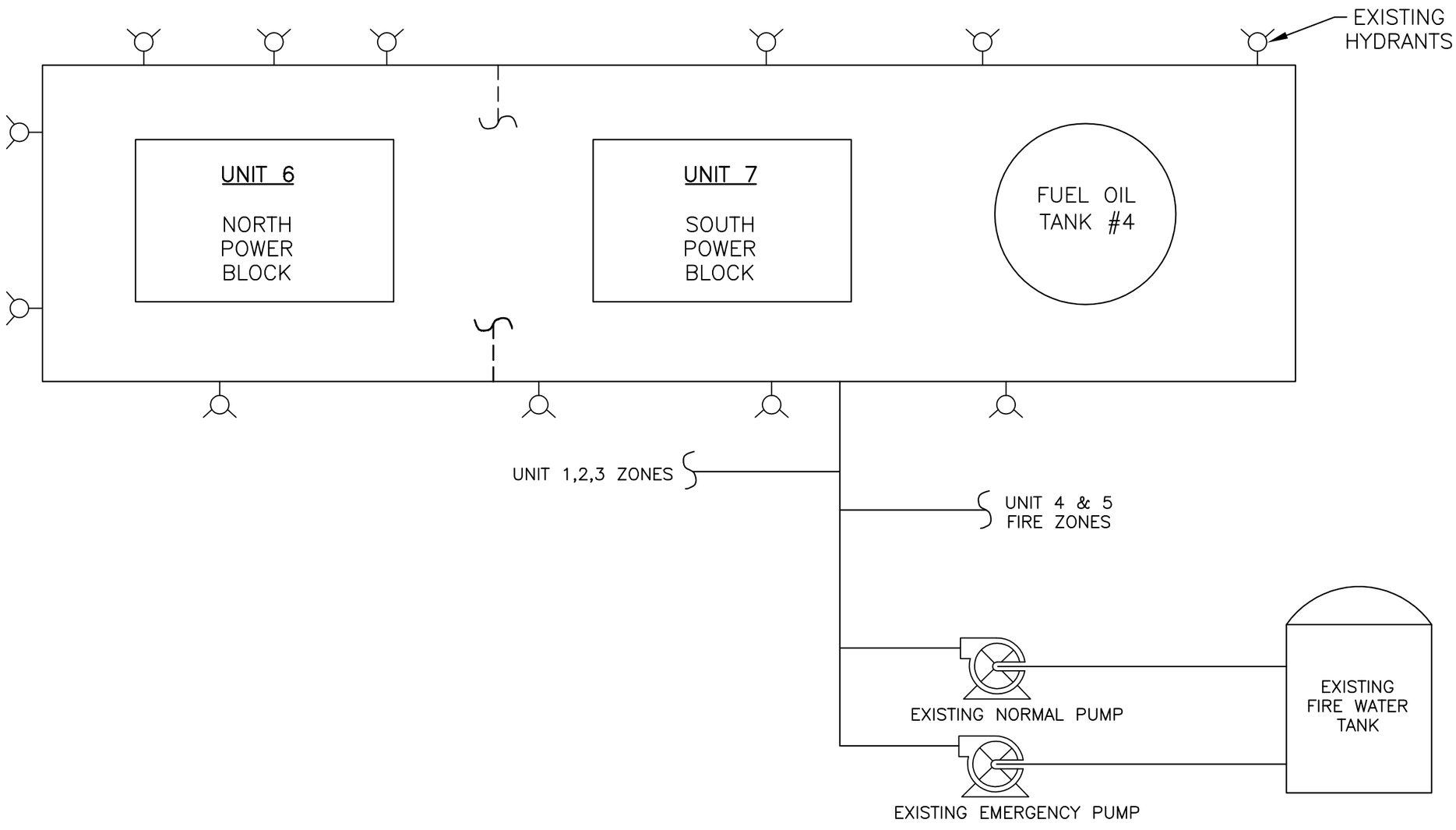
I asked the marshal if he was familiar with the proposed project. He replied that there is no person in Carlsbad not familiar with it, since the community is greatly opposed to it and the City has voted against it. Since Encina PP is supposed to be closed down in several years, the community would rather not have any power plant at that site.

I asked the marshal to confirm the information provided in the AFC regarding station #1. He confirmed that the response time would be 6 minutes and that the location and staffing/equipment are correct. I asked him what is the next closest CFD station, and he replied that it would be station #4, located at 6885 Batiquitos Drive, about 3.7 miles away. This station is equipped with one engine and three firefighters per shift and would respond within 7-8 minutes. Overall the CFD has 6 stations spread over 48 square miles, so the stations are not very dense. All firefighters except for one are trained paramedics. All firefighters are trained as first responders to hazmat incidents, and some are trained as technicians and experts, although the CFD does not have the proper equipment to handle large spills, regardless of trained staff. In the event of a hazmat incident, they would rely on the San Diego hazmat team, which would take at least one hour to respond. Camp Pendleton team could also respond, but that is not guaranteed.

I asked the marshal whether he felt that the CFD was staffed and equipped to handle incidents at this proposed facility and if he thought this project would impact the CFD. He replied that currently the CFD is able to respond to incidents in its jurisdiction, but he cannot say for sure how well the department will do in the future. The CFD has not expanded while the City of Carlsbad has grown, and he feels that the CFD is stretched thin already. A particular concern is the likelihood of a seismic event in the region, which would require all the resources they have. If a regional event like that happened then the proposed CECP would certainly impact the department. Overall he cannot say for certain that the project would not impact the CFD. He said that any new facility has a potential impact on the CFD, and especially a facility with hazardous and flammable materials. I asked him if there is any particular mitigation that could minimize impacts on the CFD, and he responded that additional equipment is not very helpful without additional staff, so staffing would be the most beneficial mitigation.

ATTACHMENT B

Figure 2.2-7 – Existing EPS Fire Protection System



NOTES

A — — — — — CAPPED / ABANDONED PIPING FROM BERM DEMOLITION

FIGURE 2.2-7
EXISTING FIRE PROTECTION SYSTEM
CARLSBAD ENERGY CENTER PROJECT
CARLSBAD, CALIFORNIA

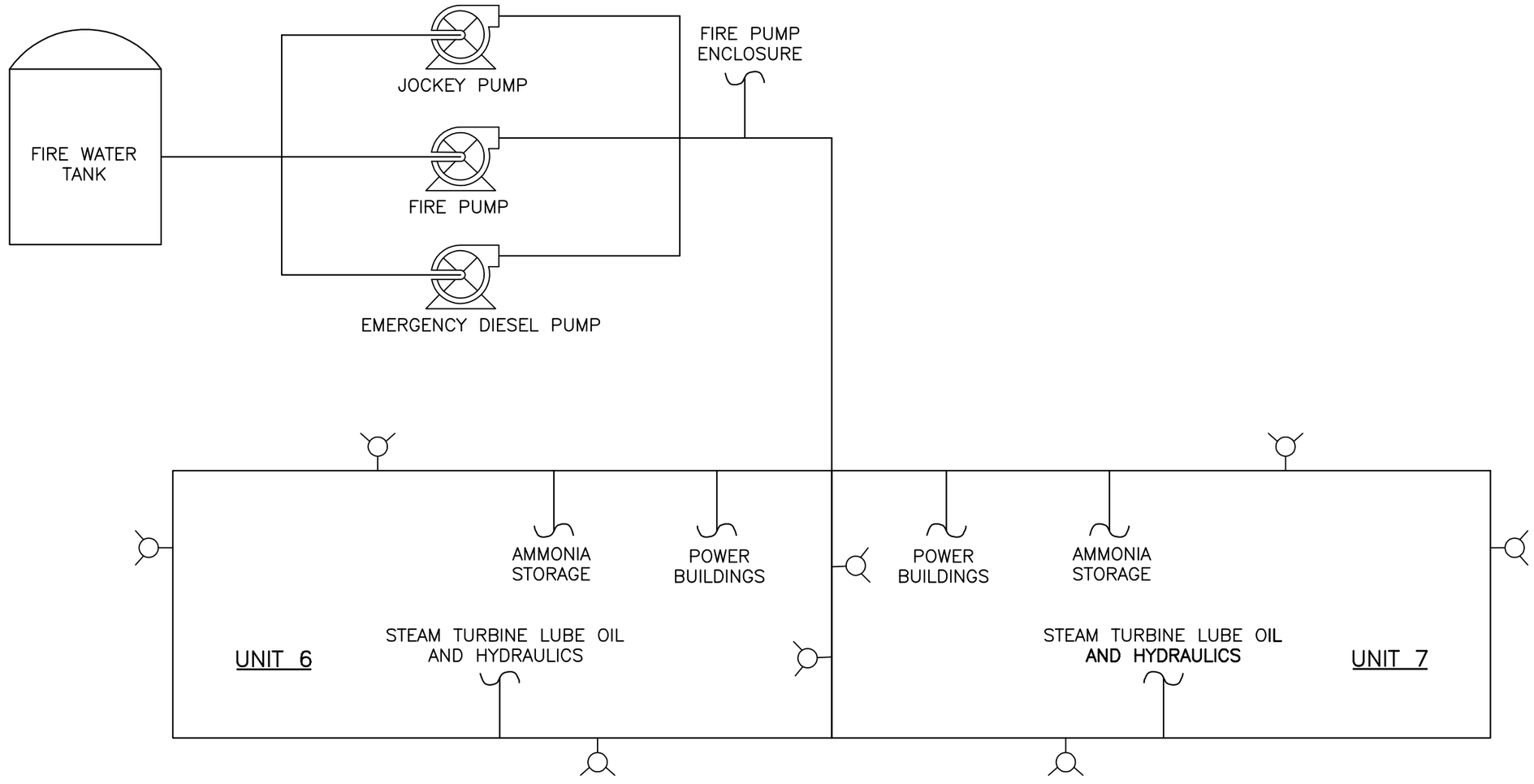
Source: Shaw Stone & Webster, Inc.

CH2MHILL

EY072007001SAC Figure_2.2-7.ai 09/07/2007 afint

ATTACHMENT C

Figure 2.2-8 – CECP New Fire Protection System



NOTES

A GAS TURBINE – FOAM AND GAS FIRE SUPPRESSION

FUEL GAS AREA AND ELECTRICAL AREAS – GAS FIRE SUPPRESSION

Source: Shaw Stone & Webster, Inc.

FIGURE 2.2-8
CECP FIRE PROTECTION SYSTEM
CARLSBAD ENERGY CENTER PROJECT
CARLSBAD, CALIFORNIA

CH2MHILL

EY072007001SAC Figure_2.2-8.ai 09/07/2007 afint

ATTACHMENT D

Table 1 – Hazardous Materials List

Hazardous Materials List

			Carlsbad Energy Center Project (CECP)			Encina Power Station (EPS)				Comparison of Existing EPS and Combined EPS Units 4&5 and CECP		
Trade Name	**Chemical Name**	**CAS Number**	**Maximum Quantity Onsite (Per Day)**	**State**	**Type of Storage**	**Maximum Quantity Onsite (Per Day)**	**State**	**Type of Storage**	**Expected Quantity for Units 4&5**	**Combined CECP and EPS Units 4 & 5**	**Exisiting EPS**	**Reduction or Increase From Existing EPS Volumes**
Aqueous-Based												
Aqueous ammonia	Aqueous ammonia (19%)	7664-41-7 (NH3)	17,000 gal	17,000 gallons	Continuously Onsite	20,000 gallons/166,560 pounds (stored in two tanks)	Liquid	10,000 gallon tank	20,000 gal	37,000 gal	20,000 gal	17,000 gal increase
Citric acid	Citric acid	77-92-9	100 lb	Varies as need (approx 100 lbs)	Initial startup and periodically onsite	N/A	N/A	N/A	N/A	100 lb	N/A	100 lb increase
Cleaning	Various	None	100 gal	Varies as needed (approx 100 gal)	Continuously Onsite	N/A	N/A	N/A	N/A	100 gal	N/A	100 gal increase
Chemicals/detergents			Varies as needed (approx 100 gal)	Liquid	Continuously Onsite	N/A	N/A	N/A	N/A	100 gal	N/A	100 gal increase
Cyanamer P-70	Proprietary	Proprietary	55 gal	55 gal	Continuously Onsite	N/A	N/A	N/A	N/A	55 gal	N/A	55 gal increase
Hydrochloric acid (reverse osmosis cleaning)	Hydrochloric acid (30%)	7647-01-0	100 gal	Various as needed (approx 100 gal)	Continuously Onsite	700 gallons	Liquid	5 gallon container	280 gal	380 gal	700 gal	320 gal reduction
Laboratory reagents (liquid)	Various	None	10 gal	10 ga liquids	Continuously Onsite	N/A	N/A	N/A	N/A	10 gal	N/A	10 gal increase
Sodium hydroxide (50% solution)	Sodium hydroxide 50%	1310-73-2	500 gal	500 gal	Continuously Onsite	N/A	N/A	N/A	N/A	500 gal	N/A	500 gal increase
Sodium hydroxide (50% solution)	Sodium hydroxide 50%	1310-73-2	N/A	N/A	N/A	25 lbs	Solid	5 lb container	10 lbs	N/A	10 lbs	15 lbs decrease
Sodium nitrate	Sodium nitrate	7631-99-4	500 lb. initially and once every 3 to 5 years	Varies as needed (approx 500 lbs)	Initial startup and periodically onsite	N/A	N/A	N/A	N/A	500 lb	N/A	500 lb increase

Hazardous Materials List

			Carlsbad Energy Center Project (CECP)			Encina Power Station (EPS)				Comparison of Existing EPS and Combined EPS Units 4&5 and CECP		
Trade Name	**Chemical Name**	**CAS Number**	**Maximum Quantity Onsite (Per Day)**	**State**	**Type of Storage**	**Maximum Quantity Onsite (Per Day)**	**State**	**Type of Storage**	**Expected Quantity for Units 4&5**	**Combined CECP and EPS Units 4 & 5**	**Exisiting EPS**	**Reduction or Increase From Existing EPS Volumes**
Sulfur hexafluoride	Sulfur hexafluoride	2551-62-4	200 lbs	200 lbs	Continuously Onsite	N/A	N/A	N/A	N/A	200 lbs	N/A	200 lb increase
Trisodium phosphate	Sodium phosphate, tribasic	7601-54-9	400 gal	400 gal	Continuously Onsite	N/A	N/A	N/A	N/A	400 gal	N/A	400 gal increase
NALCO 356	NALCO 356 Neutralizing Amine	108-91-8	N/A	N/A	N/A	110 gallons/916 pounds	Liquid	55 gallon drum	55 (assumed one 55 gallon drum)	55 gal	110 gal	55 gal reduction
Calcium Nitrate	Calcium Nitrate Aqueous Solution LO-1	13477-34-4	N/A	N/A	N/A	55 gallons	Liquid	6,000 gallon tank	22 gal	22 gal	55 gal	33 gal reduction
Liquid Nitrogen	Liquid Nitrogen	7727-37-9	N/A	N/A	N/A	3,100 gallons	Liquid	3,100 gallon tank	1,240 gal	1,240 gal	3,100 gal	1,860 gal reduction
Sulfuric Acid	Sulfuric Acid	7664-93-9	N/A	N/A	N/A	3,500 gallons/29,148 pounds	Liquid	55 gallon drum	1,400 gal	1,400 gal	3,500 gal	2,100 gal reduction
Oxygen Scavenger	Elimin-Ox	Mixture	N/A	N/A	N/A	110 gallons	Liquid	55 gallon drum	55 gal (assumed one 55 gallon drum)	55 gal	110 gal	55 gal reduction
Super Big Tex	Suber Big Tex, aqueous alkaline surfactant	Mixture	N/A	N/A	N/A	110 gallons	Liquid	55 gallon drum	55 gal (assumed one 55 gallon drum)	55 gal	110 gal	55 gal reduction
Sodium Hypochlorite	Sodium Hypochlorite	7681-52-9	N/A	N/A	N/A	110 gallons	Liguid	55 gallon plastic/nonmetallic drum	55 gal (assumed one 55 gallon drum)	55 gal	110 gal	55 gal reduction
Sodium Hypochlorite	Sodium Hypochlorite	7681-52-9	N/A	N/A	N/A	12,000 gallons	Liquid	6,000 gallon tank (2 tanks)	6,000 gal	6,000 gal	12,000 gal	6,000 gal reduction
Hi-Chem HMP	Hi-Chem HMP	128-04-1	N/A	N/A	N/A	55 gallons	Liquid	55 gallon plastic/nonmetallic drum	55 gal (assumed one 55 gallon drum)	55 gal	55 gal	No change
Permatreat PC-191	Proprietary mixture	Proprietary	400 gal	400 gal	Continuously Onsite	N/A	N/A	N/A	N/A	400 gal	N/A	400 gal increase
Fyrquel ECH	Fryrquel ECH	Mixture	N/A	N/A	N/A	220 gallons	Liquid	55 gallon drum	55 gal (assumed one 55 gallon drum)	55 gal	220 gal	165 gal reduction
Corrosion Inhibitor	NALCO 8322	Mixture	N/A	N/A	N/A	55 gallons	Liquid	55 gallon drum	55 gal (assumed one 55 gallon drum)	55 gal	55 gal	No change
Spectrus NX1106	Spectrus NX1106	Mixture	N/A	N/A	N/A	55 gallons	Liquid	55 gallon drum	55 gal (assumed one 55 gallon drum)	55 gal	55 gal	No change
Laboratory reagents (solid)	Various	None	100 lb	100 lbs solids	Continuously Onsite	N/A	N/A	N/A	N/A	100 lb	N/A	100 lb increase
Nitric Acid	Nitric Acid	7697-37-2	N/A	N/A	N/A	10 gallons/83.28 pounds	Liquid	1 gallon glass bottle	10 lbs	10 lbs	10 lbs	No change

Hazardous Materials List

			Carlsbad Energy Center Project (CECP)			Encina Power Station (EPS)				Comparison of Existing EPS and Combined EPS Units 4&5 and CECP		
Trade Name	**Chemical Name**	**CAS Number**	**Maximum Quantity Onsite (Per Day)**	**State**	**Type of Storage**	**Maximum Quantity Onsite (Per Day)**	**State**	**Type of Storage**	**Expected Quantity for Units 4&5**	**Combined CECP and EPS Units 4 & 5**	**Exisiting EPS**	**Reduction or Increase From Existing EPS Volumes**
Fuel Oils												
Diesel No. 2	Oil	None	200 gal	200 gal	Continuously Onsite	60,000 gallons	Liquid	20,000 gallon tank	60,000 gal	60,200 gal	60,000 gal	200 gal increase
Fuel Oil #6	#6 Fuel Oil	68553-00-4	N/A	N/A	N/A	30,000,000 gallons	Liquid	18,9, 10.5, and 5.5 million gallon tanks	0 gal	0 gal	30 M gal	30 M gal reduction
Petroleum-Based												
Hydraulic oil	Oil	None	500 gal	500 gal	Continuously Onsite	55 gallons	Liquid	55 gallon steel drum	55 gal (assumed one 55 gallon drum)	555 gal	55 gal	500 gal increase
Lubrication oil	Oil	None	40,000 gal	40,000 gal	Continuously Onsite	55 gallons	Liquid	Steel drum	55 gal (assumed one 55 gallon drum)	40,055 gal	55 gal	40,000 gal increase
Mineral insulating oil	Oil	8012-95-1	80,000 gal	80,000 gal	Continuously Onsite	N/A	N/A	N/A	N/A	80,000 gal	N/A	80,000 gal increase
DTE 797 Lubricating Oil	Mobil DTE 797	N/A	N/A	N/A	N/A	3,000 gallons	Liquid	6,000 gallon tank	1,200 gal	1,200 gal	3,000 gal	1,800 gal reduction
Gases												
Oxygen	Oxygen	7782-44-7	880 cubic feet	880 cubic feet	Continuously Onsite	3,000 cubic feet	Gas	250 cu ft. cylinder	1,200 cf	2,080 cf	3,000 cf	920 cf reduction
Compressed gas	Argon Gas	7440-37-1	N/A	N/A	N/A	6,000 pounds	Gas	336 cu. ft. cylinder	2,400 cf	2400 cf	6,000 cf	3,600 cf reduction
Hydrogen Gas	Hydrogen Gas	1333-74-0	N/A	N/A	N/A	38,938 cubic feet	Gas	3,244.83 cu. ft. cylinder	15,575 cf	15,575 cf	38,938 cf	23,363 cf reduction
Acetylene Gas	Acetylene Gas	74-86-2	N/A	N/A	N/A	1,500 cubic feet	Gas	400 cu.ft. one cylinder	600 cf	600 cf	1,500 cf	900 cf reduction
Nitrogen, Compressed	Nitrogen Gas	7727-37-9	N/A	N/A	N/A	500 cubic feet	Gas	228 cu. ft. one cylinder	200 cf	200 cf	500 cf	300 cf reduction
Nitric Oxide	Nitric Oxide	10102-43-9	N/A	N/A	N/A	1,100 cubic feet / 68,607 pounds	Gas	140 cf cylinder	440 cf	440 cf	1,100 cf	66 cf reduction
Carbon Dioxide Gas	Carbon Dioxide Gas	124-38-9	N/A	N/A	N/A	500 cubic feet	Gas	143 cu. ft. one cylinder	200 cf	200 cf	500 cf	300 cf reduction
Carbon Monoxide	Carbon Monoxide	630-08-0	N/A	N/A	N/A	500 cubic feet	Gas	140 cu. ft. one cylinder	200 cf	200 cf	500 cf	300 cf reduction
Helium Gas	Helium Gas	7440-59-7	N/A	N/A	N/A	2,400 cubic feet	Gas	217 cf cylinder	960 cf	960 cf	2,400 cf	1,440 cf reduction